

What is claimed is:

- 1 1. A capillary assisted loop thermosiphon apparatus comprising:
  - 2 at least one evaporator connected by a vapor line to a condenser; a liquid line connecting
  - 3 the condenser and the evaporator; the evaporator is in the direction of gravity from the condenser
  - 4 such that the condenser supplies liquid under gravity induced pressure to the evaporator, and the
  - 5 evaporator has a vertical capillary wick in which liquid wicks in the direction of gravity.
- 1 2. The capillary assisted loop thermosiphon apparatus as in claim 1 wherein,
  - 2 a heat conducting capillary wick extends vertically against a heat absorbing surface on
  - 3 the evaporator; and a vapor collection cavity extends vertically along the capillary wick, the
  - 4 vapor collection cavity being connected to the vapor line.
- 1 3. The capillary assisted loop thermosiphon apparatus as in claim 1 wherein,
  - 2 a liquid line irrigator connected to the liquid line supplies liquid under gravity induced
  - 3 pressure to a vertical heat conducting section of the capillary wick;
  - 4 the capillary wick extends in conducting engagement along at least one heat absorbing
  - 5 surface on the evaporator; and
  - 6 a vertical vapor collection cavity in the heat conducting section of the capillary wick
  - 7 extends vertically along the capillary wick, and the vapor collection cavity is connected to the
  - 8 vapor line.
- 1 4. The capillary assisted loop thermosiphon apparatus as in claim 1 wherein,
  - 2 a liquid line irrigator is connected to the liquid line, and the liquid line irrigator extends
  - 3 along a top portion of the capillary wick to dispense liquid to the top portion of the capillary
  - 4 wick.
- 1 5. The capillary assisted loop thermosiphon apparatus as in claim 1 wherein,
  - 2 the capillary wick is a layer of porous sintered material on a sheet of conducting material.
- 1 6. The capillary assisted loop thermosiphon apparatus as in claim 1 wherein,

2        a liquid line irrigator connects to the liquid line, the liquid line irrigator extends along the  
3        capillary wick, and a series of fluid dispensing openings in the liquid line irrigator distributes  
4        working fluid along the capillary wick.

1        7.        The capillary assisted loop thermosiphon apparatus as in claim 1 wherein,  
2                the capillary wick is a first layer of porous sintered material on a first sheet of conducting  
3                material, and a second layer of porous sintered material on a second sheet of conducting  
4                material; and

5                a liquid line irrigator is connected to the liquid line, the liquid line irrigator has both, a  
6                first series of openings dispensing liquid phase working fluid on the first layer, and a second  
7                series of openings dispensing liquid phase working fluid on the second layer.

1        8.        The capillary assisted loop thermosiphon apparatus as in claim 1 wherein,  
2                the capillary wick is a first layer of porous sintered material on a first sheet of conducting  
3                material, and a second layer of porous sintered material on a second sheet of conducting  
4                material; and

5                reinforcing rods between the first layer and the second layer define a vapor collection  
6                cavity therebetween; and the vapor collection cavity connects with the vapor line.

1        9.        The capillary assisted loop thermosiphon apparatus as in claim 1 wherein,  
2                the capillary wick is a layer of porous sintered material on a sheet of conducting material;  
3                and  
4                reinforcing rods define a vapor collection cavity along the capillary wick.

1        10.       The capillary assisted loop thermosiphon apparatus as in claim 1 wherein,  
2                the capillary wick is a layer of porous sintered material on a sheet of conducting material;  
3                and  
4                reinforcing rods extend across a surface of the capillary wick and define a vapor  
5                collection cavity along the surface.

1        11.       The capillary assisted loop thermosiphon apparatus as in claim 1 wherein,

2           the vapor line connects to a first manifold having multiple outlets for connecting  
3        respective vapor lines of multiple evaporators;  
4           the liquid line connects to a second manifold having multiple outlets for connecting  
5        respective liquid line irrigators; and  
6           the respective liquid line irrigators distribute liquid to respective capillary wicks of the  
7        multiple evaporators.

1   12.   The capillary assisted loop thermosiphon apparatus as in claim 1 wherein,  
2       the vapor line connects to a first manifold having multiple outlets for connecting  
3       respective vapor lines of multiple evaporators;  
4       the liquid line connects to a second manifold having multiple outlets for connecting to  
5       respective liquid line irrigators for the multiple evaporators; and  
6       the multiple evaporators are interconnected along their bottoms to share a common liquid  
7       reservoir.

1   13.   The capillary assisted loop thermosiphon apparatus as in claim 1 wherein,  
2       reinforcing rods extend lengthwise across a surface of the capillary wick and define the  
3       vapor collection cavity, and prevent collapse of the capillary wick into the vapor collection  
4       cavity.

1   14.   The capillary assisted loop thermosiphon apparatus as in claim 1 wherein,  
2       the capillary wick is a layer of sintered conducting material on a sheet of conducting  
3       material; and  
4       reinforcing rods extend lengthwise across a surface of the capillary wick and define the  
5       vapor collection cavity, and prevent collapse of the capillary wick into the vapor collection  
6       cavity.

1   15.   The capillary assisted loop thermosiphon apparatus as in claim 1 wherein,  
2       the capillary wick is a layer of sintered conducting material on a sheet of conducting  
3       material;  
4       a liquid line irrigator is connected to the liquid line;  
5       the liquid line irrigator extends along a top portion of the capillary wick; and

6           a series of fluid distribution openings in the liquid line irrigator supplies liquid to the  
7       capillary wick, at least a pair of sheets (204) with at least one of the sheets (204) having a  
8       corresponding wick portion (200) attached thereto.

1       16. The capillary assisted loop thermosiphon apparatus as in claim 1 wherein,  
2           the capillary wick is a first layer of porous sintered material on a first sheet of conducting  
3       material, and a second layer of porous sintered material on a second sheet of conducting  
4       material;  
5           reinforcing rods between the first layer and the second layer define a vapor collection  
6       cavity therebetween; and the vapor collection cavity connects with the vapor line; and  
7           the reinforcing rods are secured to at least one porous backing layer.

1       17. A capillary assisted loop thermosiphon apparatus comprising:  
2           at least one evaporator connected by a vapor line to a condenser; a liquid line connecting  
3       the condenser and the evaporator; the evaporator is in the direction of gravity from the condenser  
4       such that the condenser supplies liquid under gravity induced pressure to the evaporator; and the  
5       evaporator has at least a pair of sheets, with at least one of the sheets having a corresponding  
6       wick portion attached thereto to provide a vertical capillary wick in which liquid wicks in the  
7       direction of gravity.

1       18. The capillary assisted loop thermosiphon apparatus as in claim 17 wherein,  
2           a vapor collection cavity extends vertically along the capillary wick, and the vapor  
3       collection cavity is connected to the vapor line.

1       19. The capillary assisted loop thermosiphon apparatus as in claim 17 wherein,  
2           a liquid line irrigator connected to the liquid line supplies liquid under gravity induced  
3       pressure to a vertical heat conducting section of the capillary wick;  
4           the capillary wick extends in conducting engagement along at least one heat absorbing  
5       surface on the evaporator; and  
6           a vapor collection cavity in the heat conducting section of the capillary wick extends  
7       vertically along the capillary wick, and the vapor collection cavity is connected to the vapor line.

1       20. The capillary assisted loop thermosiphon apparatus as in claim 17 wherein,

2        a liquid line irrigator is connected to the liquid line, and the liquid line irrigator extends  
3    along a top portion of the capillary wick to dispense liquid to the top portion of the capillary  
4    wick.